

SEDIMENT TOXICITY FOCUS GROUP
SEDIMENT TOXICITY RECOMMENDATION #1
FOLLOW UP ACTIVITIES AFTER OBSERVED SEDIMENT TOXICITY
12 June 2006

OBJECTIVE: The objective of this requirement is to obtain information regarding the possible cause of sediment toxicity, when sediment toxicity is observed in Coalition samples. By identifying the possible cause of toxicity, the influence of agricultural practices on the observed toxicity can be evaluated, and management practices can be designed and implemented to reduce or eliminate the contribution from agricultural sources.

PROBLEM STATEMENT: The Assessment Monitoring section of the draft Coalition Group MRP requires sampling and analysis for sediment toxicity using the test species *Hyalella azteca* or *Chironomus tentans*, but the MRP does not clearly specify what follow up actions should be conducted when toxicity to sediment test species is exhibited. The MRP needs to provide specific guidance regarding follow up actions in response to observed sediment toxicity, so that the possible cause of the toxicity can be identified, and appropriate mitigation efforts can be initiated. Guidance for the follow up approach should be scientifically based (and Coalition specific if necessary), so that resources are used appropriately and efficiently. Efforts to mitigate sediment toxicity are required to comply with the narrative toxicity and pesticides objectives in the Basin Plan. There are currently no established numeric sediment quality criteria for specific chemical or physical parameters.

Currently, the follow up actions prescribed in the MRP in response to observed toxicity either explicitly or implicitly refer to water column organisms. Specific details for follow up actions required in response to sediment toxicity are not well defined. Analysis of sediment samples for pyrethroid insecticides is indicated in Table 1 of the draft MRP, however the required frequency for chemical testing is ambiguous.

Approximately 25 to 30% of the sediment samples analyzed under the Irrigated Lands Program have exhibited toxicity to the test species. Chemical analysis of about 200 of these samples has shown that concentrations of pyrethroids and chlorpyrifos can account for the observed toxicity in approximately 75% of the instances. Reproducible Toxicity Identification Evaluation (TIE) procedures are still under development for sediment. Approved TIE procedures for sediment are not currently available.

Therefore, the Sediment Toxicity Focus Group is making the following recommendation to the TIC:

RECOMMENDATION:

Sediment samples that show “statistically significant” toxicity at the end of an acceptable test and that exhibit a $\geq 20\%$ reduction in organism survival compared to the control will require chemical analysis of the same sample in an effort to determine the possible cause of toxicity. When sediment samples are collected for toxicity analysis, additional sample volume sufficient for the recommended chemical and physical analyses must be collected, in the event that the sample exhibits toxicity. This additional sample volume must be held in frozen storage, until the results of the toxicity analysis are available. If

the sample is not toxic to the test species, the additional sample volume can be discarded. If the toxicity criterion described above is exceeded, then the additional sample volume must be analyzed for Bifenthrin, Cyfluthrin, Lambda-Cyhalothrin, Cypermethrin, Deltamethrin, Esfenvalerate, Fenpropathrin, Permethrin, and Chlorpyrifos. To allow comparison to established lethal concentrations of these chemicals to the test species, analysis at practical reporting limits of 1 µg/kg on a dry weight basis is required. Additionally, the sample must be analyzed for total organic carbon (TOC) and grain size. Analysis for TOC is necessary to evaluate the expected magnitude of toxicity to the test species.

It is recommended that the narrative in the draft MRP be changed to include the following text:

“Sediment samples that show “statistically significant” toxicity at the end of an acceptable test and that exhibit a $\geq 20\%$ reduction in organism survival compared to the control will require chemical analysis of the same sample in an effort to determine the possible cause of toxicity. When sediment samples are collected for toxicity analysis, additional sample volume sufficient for the recommended chemical and physical analyses must be collected, in the event that the sample exhibits toxicity. This additional sample volume must be held in frozen storage, until the results of the toxicity analysis are available. If the sample is not toxic to the test species, the additional sample volume can be discarded. If the toxicity criterion described above is exceeded, then the additional sample volume must be analyzed for Bifenthrin, Cyfluthrin, Lambda-Cyhalothrin, Cypermethrin, Deltamethrin, Esfenvalerate, Fenpropathrin, Permethrin, and Chlorpyrifos. Analysis at practical reporting limits of 1 µg/kg on a dry weight basis for each pesticide is required to allow comparison to established lethal concentrations of these chemicals to the test species. Additionally, the sample must be analyzed for total organic carbon (TOC) and grain size. Analysis for TOC is necessary to evaluate the expected magnitude of toxicity to the test species.”